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Variations in Serum Ferritin in Different Professionals of Mirpurkhas.

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Abstract:

Introduction: Serum ferritin has been shown to be a good biomarker of body iron stores. Iron is essential mineral that functions to bind oxygen as a part of Heme in Hemoglobin and Myoglobin[1]. Ferritin, a major protein regulating iron homeostasis, is used as a biomarker for iron status and low grade inflammation, which results in free radical damage to cells and tissues[18-19]. Accordingly, recent studies demonstrated that serum ferritin concentrations are correlated with diabetes mellitus, insulin resistance, metabolic syndrome, ischemic heart disease, cardiovascular disease, and nonalcoholic fatty liver disease (NAFLD) in healthy men and obese patients.

Objective: The study was aimed to evaluate possible variations in serum ferritin levels in different professional of Mirpurkhas.

Methodology: 250 subjects were randomly selected from the local community of Mirpurkhas from OPDs of Civil Hospital Mirpurkhas and Muhammad Medical College Mirpurkhas. Their Serum ferritin was determined by ELISA. And the data was analyzed by SPSS 15.

Results: This was a cross-sectional study. Out of 250 subjects 170 (68%) were male and 80 (32%) were female. The mean age was 55.20 ± 11.046 year the mean height of subjects was 1.6732 ±.09637 meters while the mean weight was estimated as 65.50 ±11.589 kgs. The mean BMI was calculated as 24.2772 ±3.34493 kgs/m^2. Serum ferritin was ranged between 46-450 ng/ml of blood with mean serum ferritin 226.32 ± 99.027 ng/ml of blood. Serum Ferritin in male was found 233.59 ±98.366 ng/ml of blood and in female was found to be 210.88 ± 99.268 ng/ml of blood. It was found that the mean serum ferritin in teachers was 181.00 ± 42.312 ng/ml, in doctors 286.67 ±67.788 ng/ml, in farmers 267.91 ±78.188 ng/ml, in laborers 174.40 ±108.939 ng/ml, in house wives 201.14 ±112.797 ng/ml, in Clerks office superintendents 205.50 ±16.338 ng/ml, in peon/ masi/ attendants 233.00 ± 135.262 ng/ml, in unemployed 120.00 ± .000 ng/ml, in retired 304.20 ± 89.084 ng/ml and in Businessmen 193.17 ±89.084 ng/ml. A comparison was made between serum ferritin values of different professionals by applying ANOVA test and found that there is a significant difference between serum ferritin values of different professional with highly significant p=.000 value.

Conclusion: It was found that serum ferritin level was not similar in all profession and different type of work do affect its level inside the body.

Introduction:

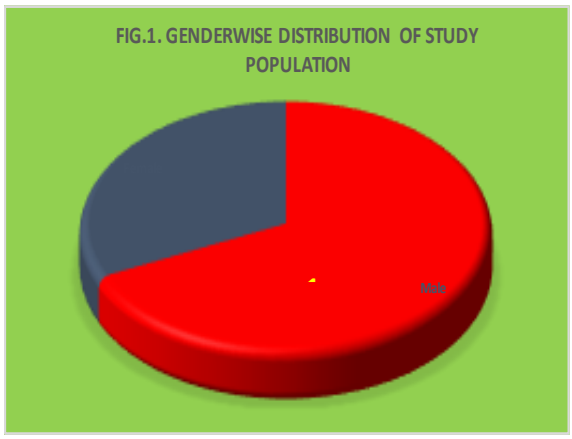
Serum ferritin has been shown to be a good bio marker of body iron stores. Iron is essential mineral that functions to bind oxygen as a part of Heme in Hemoglobin and Myoglobin[1]. Iron is an important mineral in normal physiological processes, and ferritin is a specialized iron storage protein, which reflects iron stores in the body[2]. Serum ferritin (SF) has been found to be a reliable tool, providing that confounding effects by inflammatory, hepatic, or neoplastic diseases are excluded[3]. It has been used as a surrogate variable to reflect body iron stores in healthy individuals. Previous studies have demonstrated an association between increased SF levels and higher risks of diabetes[4-5]. Iron plays an important role in maintaining physiological homeostasis in the body; however, excess iron can lead to free radical damage, resulting in tissue damage[6]. Ferritin, one of the key proteins regulating iron homeostasis, is a widely available clinical biomarker to evaluate iron status and is especially important for detecting iron deficiency[7]. Several studies have reported an association between serum ferritin concentration and insulin resistance or type 2 diabetes[8-11] and it has been suggested that disturbances of iron metabolism are part of the metabolic syndrome, which associates insulin resistance, hyperinsulinemia, hyperglycemia, dyslipidemia and central obesity[12-14]. Heme iron intake, which is exclusively provided by red meat, poultry, and fish, is positively associated with increased BP[15]. On the other hand, low non-heme iron intake, abundant in fruits, vegetables, and cereal products, is associated with a greater risk of hypertension[15]. A cross-sectional study using serum ferritin as an indicator of iron stores showed that serum ferritin levels and the prevalence of hyperferritinemia were increased in men with hypertension compared with normotensive healthy individuals[16]. Chronic inflammation can affect certain pathologic processes in type 2 diabetes, cardiovascular disease, and metabolic syndrome[17]. Ferritin, a major protein regulating iron homeostasis, is used as a biomarker for iron status and low grade inflammation, which results in free radical damage to cells and tissues [18-19]. Accordingly, recent studies demonstrated that serum ferritin concentrations are correlated with diabetes mellitus, insulin resistance, metabolic syndrome, ischemic heart disease, cardiovascular disease, and nonalcoholic fatty liver disease (NAFLD) in healthy men and obese patients [20-26]. A recent prospective study using the Health Promotion Center data of the general Korean population indicated that serum ferritin, not iron level, was determined as a significant predictor of hypertension in middle-aged Korean men, possibly due to insulin resistance, fatty live disease, and oxidative stress [27]. All these facts prompt us to know more regarding serum ferritin as variations in its concentration can cause serious effects on human body.

Objective: The study was aimed to evaluate possible variations in serum ferritin levels in different professional of Mirpurkhas

Methodology: 250 subjects were randomly selected from the local community of Mirpurkhas from OPDs of Civil Hospital Mirpurkhas and Muhammad Medical college Mirpurkhas; after written consent 2ml blood was drawn by venipuncture from supracubital vein. Serum ferritin was estimated by Elisa. Subjects suffering from chronic debilitating diseases like tuberculosis, chronic hepatitis, liver cirrhosis, nephrotic syndrome, parathyroid diseases, Diabetes mellitus, heart failure, bleeding disorders etc. were excluded. The data was analyzed by SPSS version 15 and charts were made by MS office Excel 2013.

Results:

This was a crossectional study which was conducted during July 2015 to September 2016. Out of 250 subjects 170 (68%) were male and 80 (32%) were female (Fig.1). The mean age was 55.20 ± 11.046 years the mean height of subjects was 1.6732 ± .09637 meters while the mean weight was estimated as 65.50 ± 11.589 kgs. The mean BMI was calculated as 24.2772 ± 3.34493 kgs/m^2 (Table.1). Serum ferritin was ranged between 46-450 ng/ml of blood with mean serum ferritin 226.32 ± 99.027 ng/ml of blood. Serum Ferritin in male was found 233.59 ± 98.366 ng/ml of blood and in female was found to be 210.88 ± 99.268 ng/ml of blood (Table.2 and Fig.2). Serum ferritin was analyzed in different professionals and it was found that the mean and std. deviation values were quite different in different professionals. It was found that the mean serum ferritin in teachers was 181.00 ± 42.312 ng/ml, in doctors 286.67 ± 67.788 ng/ml, in farmers 267.91 ± 78.188 ng/ml, in laborers 174.40 ± 108.939 ng/ml, in house wives 201.14 ± 112.797 ng/ml, in Clerks office superintendents 205.50 ± 16.338 ng/ml, in peon/ masi/ attendants 233.00 ± 135.262 ng/ml, in unemployed 120.00 ± .000 ng/ml, in retired 304.20 ± 89.084 ng/ml and in Businessmen 193.17 ± 89.084 ng/ml(Fig.3). A compared was made between serum ferritin values of different professionals by applying ANOVA test and found that there is a significant difference between serum ferritin values of different professional with highly significant p=.000 value (Table.3. and Fig.4)



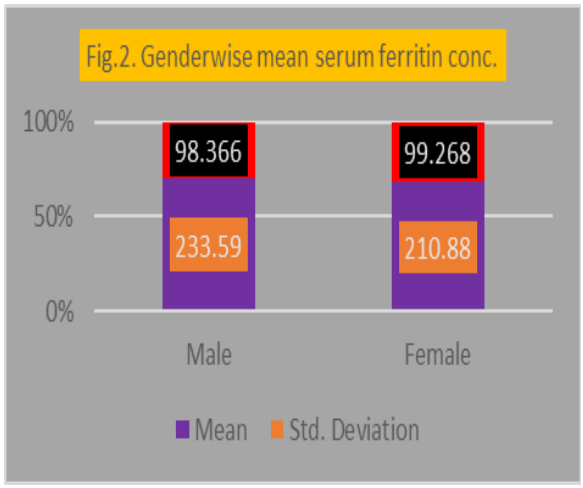
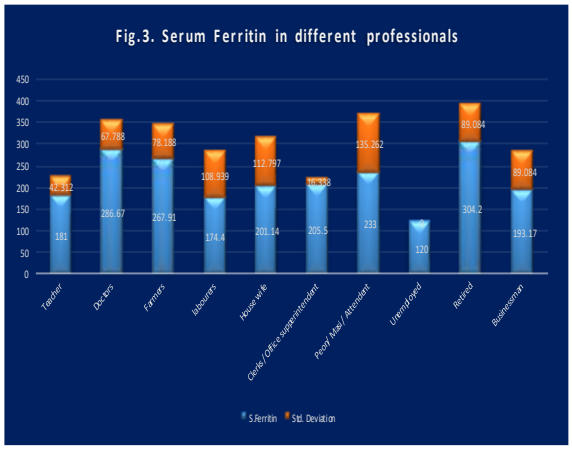


Table. 1. Descriptive statistics of Bio physiological variables

Variables	Mean	Std. deviation
Age	55.20	11.046
Height	1.6732	.09637
Weight	65.50	11.589
BMI	24.2772	3.34493

Table.2. Gender wise Serum Ferritin level

Sex	Mean	Std. Deviation
Male	233.59	98.366
Female	210.88	99.268
Total	226.32	99.027



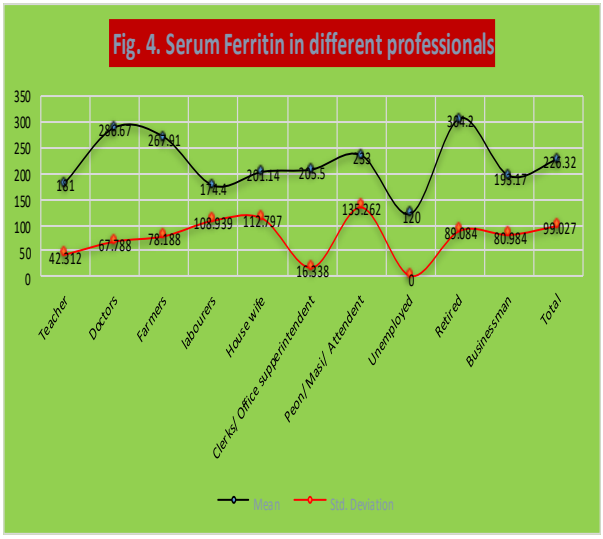


Table.3. Comparison of Serum Ferritin in different occupation.

Variables	Teachers	Doctors	Farmers	Laborers	House wife	Clerks/ Office superintendent	Peon/ Masi/ Attendant	Unemployed	Retired	Businessman	p-value
S. Ferritin	181.00	286.67	267.91	174.40	201.14	205.50	233.00	120.00	304.20	193.17	.000
Std. Deviation	42.312	67.788	78.188	108.939	112.797	16.338	135.262	.000	89.084	89.084	

Discussion:

Measurement of serum iron and total iron binding capacity are widely used in the diagnosis and treatment of iron deficiency anemia and chronic inflammatory disorders. The clinical assessment of iron stores relied on de termination of serum iron, total iron binding capacity and percent transferrin. The Saudi Arabian Study in shows the mean serum ferritin was 78.19 ± 34.09 ng/ml in control group and 123.26 ± 63.10 ng/ml in Saudi fire fighters in Jedda[28]. While in our study it was found that the mean serum ferritin in teachers was 181.00 ± 42.312 ng/ml, in doctors 286.67 ± 67.788 ng/ml, in farmers 267.91 ± 78.188 ng/ml, in laborers 174.40 ± 108.939 ng/ml, in house wives 201.14 ± 112.797 ng/ml, in Clerks office superintendents 205.50 ± 16.338 ng/ml, in peon/ masi/ attendants 233.00 ± 135.262 ng/ml, in unemployed 120.00 ± .000 ng/ml, in retired 304.20 ± 89.084 ng/ml and in Businessmen 193.17 ± 89.084 ng/ml(Fig.3). While a study in Switzerland on international road cyclist shows that the mean serum ferritin was 359ng/ml in year 1999, 277 ng/ml in year 2000, 255 ng/ml in year 2001 and 242 ng/ml in year 2002[29]. In a study in Beijing China Lu L et.al. on professional welders suggested that serum concentrations of ferritin and transfusion were increased among welders, while serum transferrin receptor levels were significantly decree sed in comparison to controls. Linear regression analysis revealed a lack of association between serum levels of manganese and iron. However, serum concentrations of iron and ferritin were positively associated with years of welder experience ($p < 0.05$)[30]. In our study it was found that there is a considerable difference between the mean and std. deviation values of serum ferritin (p=.000) (Table.3). These facts prompt one's mind not only to think but also take certain preventive measures regarding serum ferritin as it is the main iron binding protein in the body.

Conclusion:

It was found that serum ferritin level was not similar in all profession and different type of work do affect its level inside the body. More work is required in this field especially in Pakistan where anemia is the most common health problem.

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